GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, OCTOBER 29, 1890.

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The Improvement of Trees.

IMMENSE progress has been made, certainly, in the last two hundred years in collecting facts about the trees of the world and their utility to man, and much has been done toward determining the best methods for their cultivation and something for their improvement. There is still, however, much work of practical value to be accomplished by the scientific dendrologist, whether his investigations are directed to the improvement of forests or to the study of trees from the gardener's point of view.

Trees useful primarily for the production of timber require long years, some of them centuries, in which to complete the cycle of their existence. The observer who records his investigations on the seedling Oak or Pine cannot hope to do more than see the seedling become a vigorous young tree. Then another man must take up the investigation where the first dropped it, and so on from generation to generation of men until the tree has lived out its long existence. The difficulty of careful and sustained observations made on growing plants increases immensely as their period of individual life is lengthened; a man who is ready to undertake the most minute and difficult investigations in plant life whenever he feels that there is a chance of his reaping a reward during his own life, hesitates naturally when he knows that his work can only be finished, if finished at all, by unknown hands. This, perhaps, is the reason why fruits and vegetables and flowers have been improved by selection and hybridization, and why the selection of individual trees to be grown for timber is still left largely to chance.

It can hardly be doubted, however, that trees, whether grown for timber or for ornament, can be improved by methods similar to those which have been used for the development of our modern fruits and vegetables, and that the time must come when the same attention will be paid by scientific foresters to the improvement of races of timber-trees as is now paid to the improvement of plants of far less importance to the human race.

There are certain individuals of every species of plants which, for some reason or other, grow more vigorously than others or possess other exceptional qualities. This fact has been taken advantage of to establish new races of garden-plants, but in the case of trees it has been too generally overlooked, and sufficient attention has never been paid to the selection of the seed-bearing parents, the mothers of future forests. The whole question of the improvement of trees, whether as producers of timber or merely as ornaments of gardens and parks, is still before us. Humbler plants often gain hardiness by the mingling of the blood of allied species, and what little has been learned of the few natural hybrid trees known to exist shows plainly that it is within the bounds of possibility to produce trees artificially by hybridization which may possess certain qualities to a greater degree than either of their parents. Then there is the whole question of the relation of the stock to the graft as applied to the production of timber-trees to be investigated. It is known that certain trees, when it is desirable to produce them under certain conditions, grow much more rapidly and vigorously, while young at least, if they are grafted, than they do on their own roots; but time and careful observations are needed to determine what results, from economical points of view, will finally be obtained by such a method of propagation.

All such questions as these are matters which must one day occupy the attention of scientific foresters, and which can only be solved at well equipped forest-stations, which all governments, following the example of Germany, can wisely establish; for without the stability which governments alone can give, scientific observations, demanding a longer period than the life of one generation of men, are apt to be barren of useful fruit.

Such thoughts naturally lead us to consider whether it is not possible to increase the number of ornamental trees to be grown in any particular region and the beauty of individuals by the application of the same rules of selection of seed from exceptionally fine individuals as we now employ in producing cabbages or radishes. This seems such an evident proposition that it requires no argument to support it; and yet how few persons who raise trees from seeds pay the slightest attention to the character or health of the individual which supplies them. For the ordinary collector of tree-seeds in the nursery or the forest a seed is a seed, and the fact is ignored or forgotten that the constitutional weakness of an individual plant can be transmitted through its seed. Neglect to properly select the seed-parent is doubtless the cause why many nursery-grown trees fail before their time, and why seedlings raised from trees subjected in cultivation to more or less unnatural conditions are less desirable than those raised from individuals growing spontaneously under the most favorable natural conditions.

The possibilities of tree-culture widen when it is considered that there are certain species which possess a much greater power than others of adapting themselves to their surroundings—that is, which possess greater constitutional flexibility. Such species are able to exist over wide areas through individuals being able to support greatly diversified climatic conditions. If this fact is taken advantage of and trees for any particular region are raised from seed grown in a climate as similar as possible to that where the seedlings are to be planted, these may be expected to adapt themselves to their new surroundings more readily than if the seed-parent had grown in a less favorable locality. This is shown by the familiar instance of the Douglas Spruce. This tree is widely distributed in western America from British Columbia to Mexico, and eastward to the eastern base of the Rocky Mountains. It was first made known from the neighborhood of Puget Sound, where the climate is mild and humid. Plants raised from seed collected there grow well in England, where the climate is not dissimilar to that of our north-west coast; but when these plants were brought from England to our eastern states they failed entirely. Many years later this tree was found in the Rocky Mountains in a severe climate, and seeds from the Colorado trees were planted in New England, and have proved abundantly hardy and in every way

satisfactory. This is true, too, of another widely distributed western tree, *Abies concolor*, which is hardy in the east when grown from seed gathered in Colorado, but only precariously hardy when the seed-parents have grown in the milder climate of the California Sierras; and it is doubtless true of all trees which have a wide north and south distribution or which grow from the sea-level up to high elevations. *Magnolia glauca* grows from Massachusetts to Florida and Texas; it is as hardy at the north as at the south, and yet no one can doubt that seedlings of this tree raised from seed gathered in Florida would produce plants which would succumb in Massachusetts during their first winter.

The study of trees with relation to their distribution and the peculiar conditions with which certain individuals of the species are surrounded is full of possibilities, and promises to greatly increase the material which can be grown in regions of severe climate. Professor Budd has already shown, by means of the useful experiments with Russian and central Asia plants which he has been carrying on in Iowa for a number of years, that individuals of many species vary remarkably in their power to adapt themselves to severe climatic conditions; and the work which has already been done in this direction can be greatly extended in the case of many of our own southern trees, which can probably be cultivated further north than is now believed possible through the selection of seeds from individuals grown at the extreme northern point of the natural distribution of the species. This is true, too, of the trees of Japan and China, where many species range north and south through as many degrees of latitude as separate Massachusetts from Florida. Many of these Asiatic trees, as we know them here in cultivation, fail because they have not always been derived from the best regions so far as climate is concerned. Even European trees, which Americans have usually obtained from England, have not always had a fair trial here, and which, had their seed-parents been selected from regions of colder or drier climate, might possibly have been able to adapt themselves to ours. We may even obtain a Cedar of Lebanon, the ambition of most American tree-planters, which will flourish in the extreme northern states, if some one will take the pains to obtain seeds from the right place. The old Cedars of England came originally from the famous grove on Mount Lebanon, which is near the southern limit of the area occupied by the species, and the plants which we have tried in this country, and which have failed with us, were raised from these English trees or from seeds gathered on the Lebanon. But in recent years the range of the species has been extended, and now it is known that this tree forms extensive forests on higher and more northern mountains than the Lebanon, in a region which furnishes trees like the Cilician Fir, which flourishes in New England better than most Firs. It is evident, therefore, that if we are ever to have a Cedar of Lebanon experiments must be made with seed gathered at the northern limit of its range; and what is possible of the Cedar of Lebanon is possible, perhaps, of the Cedar of the Himalaya and of a hundred other trees which could be mentioned, and which we consider unsatisfactory here because they have never had the best trial possible with reference to our climate.

It is by making such experiments as these that arboreta, botanic gardens and our agricultural experiment stations can do practical and useful work.

Alphonsé Karr.

ALPHONSE KARR, who recently died at Nice in his eighty-third year, was the son of a German musician, but was in heart and soul a child of the Paris where he was born. Not an act of his varied life seems to have shown, and not a line he wrote reveals, the presence of Teutonic blood. There is no need to explain the purely Gallic character of the novels which early made him famous. Even their sentimentality, though it seems alien to the France of to-day, is of the sort which characterized the France, not the Germany, of two generations ago. Nothing could speak less of a Teutonic spirit than the fact that he edited the *Figaro* for a time and established it upon the lines it still follows to-day. Purely Gallic, too, is the quality of his style—graceful, light, brilliant, digressive, shot with that kind of wit which is biting yet never bitter, and, whether sarcasm or sentiment is its theme, never passing the bounds of literary good taste. I cannot discover his mother's name, but she must surely have been a Parisian and he must surely have been her very own.

Even in his early books signs appear of that love for Nature which led him to adopt horticulture as a profession, when, disgusted with Paris after the revolution of 1848, he established himself at Nice. But it was three years before this date that he published the "Voyage autour de mon jardin," which is likely to outlive any of his other books, and the memoirs which he afterward wrote, under the title of "Livre de bord," relate only to his Parisian experiences. So there are no data from his own pen, except in the numerous articles he contributed to garden periodicals, from which an account of his practical horticultural experiences might be gathered.

However, this does not seem to be a matter of great regret, for the cast of his mind was not scientific, so it is doubtful whether much that is definitely instructive would have marked a chronicle of his later years, and the very best that he could have given us in the way of sentimental, poetic and half-humorous writing about plants is surely embalmed in his charming "Voyage." No one but a Frenchman could have written this book, and no one should read it who cannot appreciate the quality of Gallic wit and humor, and see the difference between their statements and those of sober, common-sense intelligence. But for persons who can grasp his point of view, even if they stand among the ranks of the scientific men or of the narrow, impassioned horticulturists whom he satirizes with equal gusto, the "Voyage" is most delightful reading. They realize, as one reviewer has already said, that when Karr makes fun at the expense of botanists it is as Molière made fun of doctors; and will believe that, as Molière probably was quick to call in a doctor when he needed him, so Karr really appreciated the debt the world owes to science, and even to scientific terminology, the red rag at which he tilts with most delight. Gay humor infuses every satirical line that he writes; when his words take a serious turn it is to praise the works of God, not to castigate the follies of man.

His "Voyage Around My Garden" was inspired, he tells us, by envy of a friend who was starting off on a long journey; and it is cast in the form of letters to this friend, begun when he first realized, looking out on his little domain, how easily and agreeably he could travel there, and prolonged until he works himself into a state of contempt for those who choose to go farther and fare worse. There is neither continuity nor system to these letters, and they touch on a thousand topics suggested by something in the garden, but in no sense really connected therewith. The first describes a magnificent sunset, the second a battle between spiders on the garden wall, and the next the superiority of a turf-carpet over the products of even oriental looms, while the fourth passes from birds to Marie Antoinette and Danton. Insects and savants, the difference between formal and genuine ownership in the works of Nature, the true meaning of happiness, the folly of liking tobacco (pointed by an acknowledgment of his own love for the "poison"), fables and anecdotes with flowers or lovers of flowers for their heroes, enthusiastic rhapsodies over one favorite plant or another, and jovial tales of the follies of eccentric amateurs—these are but a few of the themes he treats with infalliable delicacy of thought and expression, and with equal charm whether serious sentiment or sarcastic fun-making be his mood. In one chapter he tells us how we live in the midst of death—surrounded by dead vegetable matter, feeding on dead animals, and made comfortable and happy by the hands of long-past generations; in another he describes how his garden was ravaged by an unwelcome guest with a gun and a frantic dog, and it is hard to say which is the more attractive. One day he follows the course of the seasons by recounting how they change his little garden; another time he shows how its aspect varies during the course of twenty-four hours. Now he lies on his back in the grass and reports what he sees; then he turns over on his face and continues the chronicle. A delightful chapter tells how we might have accurate names for all the shades in the long scale of colors if we would only study common flowers and draw our terms from them. Here he tells of an old-time lover of Pinks who grew them in ivory boxes and fastened them to ebony sticks with rings of silver; there we have the history of a man who lost his fortune of 300,000 francs, as well as his peace of mind, all because a friend had seen fit to present him with

twelve Tulip-bulbs of no particular value; and again, *apropos* of the story that when Jove turned Io into a heifer he invented the Violet that she might have suitable food, he declares his intention of making a lawn exclusively of Violets. The sparkling persiflage which is the salt of the book is not spent on scientific men and Tulip-growers only; the poets come in for their share. While botanists have made flowers dull and tedious and florists have made them ridiculous, poets have vulgarized their beauty and distorted their sentiment by the constant repetition of trivial or misleading phrases. The Greeks, he declares, said five or six pretty things about the Rose; the Romans translated these and added three or four more; and later poets of all times and lands have repeated them all, without adding anything fresh, until we are bored to death by their reiteration. Equally tiresome and more foolish is the way poets introduce the name of a flower simply because it gives them an easy rhyme. How often, for instance, do they speak of the Gladiolus, simply because it rhymes with the Linden (*glaïeul* and *tilleul*), making the flower, most often, grow beneath the tree where no human eye has ever seen it. He gets quite excited over the traditional but wholly fictitious love of the butterfly for the Rose, and nothing could be more amusing than the grave way in which he demonstrates that the Violet is anything but "modest," as poets invariably assert. But to give a sample of everything the "Voyage" contains would simply be to translate the book. Suffice it to add that, while we can gather from it no facts of genuine horticultural importance (it really contains more facts about insects than about flowers), now and then we come upon a stray word which shows the difference between his time and ours. Madame Hardy was then a novelty among Roses; yellow Poppies, he says, were as impossible to find as green or blue ones, and he had never seen a red one streaked with white; he pronounces green Roses a foolish fiction, and says that, despite the great beauty of Pæonies, they are despised by horticulturists and the rich, and grow only in poor folks' gardens. In short, it is a book to charm the lover of Nature in a general way and the lover of graceful and brilliant writing—not a volume for serious students. What we admire most as we close it is "the exquisite delicacy of the senses," which he does not hesitate to boast about himself, and the easy mastery of word and phrase which shows on every page.

The *Livre de bord* is also delightful in its way, which is distinctly anecdotal. And here, too, we occasionally get brief glimpses of his passionate love of flowers. He tells us in one place that before he left Paris he came very near engaging to write a large horticultural dictionary "on a novel plan." He could not have helped making it charming, but we may well doubt whether the world is much poorer in knowledge through its abandonment. In another place he relates how he once formed a "Romancer's Garden" by collecting the queer references to plants and flowers which he chanced upon in the writings of his day. In it he planted a blue Carnation, discovered by Janin; a Chrysanthemum, likewise blue, which George Sand had possessed; a Camellia "of intoxicating perfume," invented by Rolle; a black Tulip belonging to Dumas, a climbing Azalea for which Balzac was responsible, and very many flowers which had bloomed out of season in the grounds of Eugène Sue and other romancers. It was for the compiling of catalogues of this sort, not of prosaic dictionaries, that Alphonse Karr was born. Yet he seems to have known how to grow plants so as to please the buying public as well as to delight himself, and we are glad to think of him spending his long last years—fully half his patriarchal life—solely occupied in gardens under the delicious sky of Riviera.

New York. *M. G. Van Rensselaer.*

Max Leichtlin's Garden.

IT is twelve years since I first visited the far-famed garden of Herr Max Leichtlin, at Baden, and though I have more than once attempted to describe it in the *Gardeners' Chronicle* there is always something new to be said. Within a few years it has been increased in size, but it is still far too small to contain the fine plants and bulbs which are brought together from all parts of the world through the skill, liberality and ardor of its owner. There must be something in the climate of Baden which is very favorable; for, although in winter the frost and snow are quite as severe, or even more so, than in the midland counties of England, and in summer the heat is usually greater, plants from such varied localities as Asia Minor, South Africa, Chili, Sikkim and California all seem to succeed equally well. This, in some instances, is no doubt due to the special provision made for their culture, and in others to the fresh soil which is frequently renewed in the numerous frames and beds.

Any one who has cultivated a large number of small bulbous plants in close proximity to each other knows how hard it is to keep them from becoming intermixed and to find room in suitable positions for the accessions which are constantly coming in. Herr Leichtlin has always been, and is now more than ever, an advocate for rigid selection, and he will grow nothing that is weedy, of bad habit, or easily increased by ordinary cultivators, but devotes his attention as a propagator and a hybridizer only to such plants as are new, rare or difficult to manage. He annually throws away many plants which would be highly prized by less intelligent collectors. But he never forgets a really good plant, and spares no effort to secure and prove the value of every species in any genus for which he has a special liking.

The practical experience of Herr Leichtlin during thirty years of gardening would make a work of interest and value to the botanist as well as to the gardener. This is specially true with regard to hardy plants. The feature of his garden at this time are Irises, which he has lately introduced from Asia Minor. Though but a few of these plants were still in flower on the 17th of May, they were worth a journey to see. The first plant which attracted my attention on entering the garden was a good specimen of *Ferula Narthex* in full flower. This has been sixteen years in attaining sufficient strength to bloom, and though not a showy plant, it is a very striking one. The branches when broken exude a white sap which produces the drug known as assafœtida, and which, though so unpleasant in its smell, is, when judiciously used by a skilled cook, an agreeable and valuable ingredient in many dishes. The next wonder was *Iris Lorteti*, a very rare and splendid species allied to *I. Susiana*, but much more beautiful in color, and seemingly difficult to cultivate. *Iris Gatesii*, from Asia Minor, is of the same section, but even finer, and seems much more amenable to cultivation. It was sent out for the first time this summer. *Iris lupina* and *Iris paradoxa* are two species rivaling *Masdevallia Chimæra* in beauty of structure and delicate, though not showy, coloring. Long beds of *I. Bakeriana*, *I. Bornmulleri*, which is supposed to be the same as *I. Danfordiæ*, *I. Persica purpurea* and several others, though now long past bloom, and in many instances ripening seed freely, must have been a splendid sight in the winter, when they braved the snow and frost with impunity. Fine varieties of *I. Korolkowi*, *I. Iberica* and many others were either flowering or just about to flower, and quantities of labels without names showed that many surprises are in store.

Herr Leichtlin, like all good bulb-growers, takes up annually almost all bulbous and tuberous rooted plants which have not some special peculiarity; he also puts glasses or lights over many things in order to ripen them more thoroughly and to protect them from the frequent thunder storms which prevail in this valley. The collection of Nerines and Kniphofias is quite unrivaled, and many seedlings are being raised both from selected plants of the best species in these genera and from crosses made between species which appeared capable of improvement in color or habit. It is delightful to see that however small, insignificant or difficult to manage a plant may be, every care is given it, provided it belongs to a good genus or has anything to recommend it. Many plants which have been lost almost everywhere, are to be found here awaiting the discovery either of the secret of their propagation or the introduction of something better of the same character. Among other beautiful or curious plants which I saw were *Jankæa Heldreichii*, allied to Ramondia and one of the rarest of European alpines, which had been procured with great difficulty from Mount Olympus in Thessaly; *Geranium Balkanum*, with fragrant leaves and pretty, deep rose colored flowers freely produced; *Onosma albo-roseum*, with hoary, grayish leaves, and numbers of flowers, which are white when first opened, but change to rose color afterward; *Gladiolus Kotschyanus*, a fine hardy species, quite unique in color; a wonderful double Tree Pæony of a deep lake; a very fine white Aquilegia, *A. Californica alba*, which, though self-sown, was flowering beautifully in the chinks of the large stones with which the narrow terraces are faced. This system of terracing, very similar to that adopted by vine-growers on rocky hill-sides, is calculated not only to combine depth of soil with thorough drainage, but to accumulate and store up all the sun heat possible. It may not be so picturesque as the ordinary English rock-garden, but for growing many plants which will not thrive in a flat border it is more effective; the species are much more easy to keep separate than when they are divided only by small pieces of rock or stones. I observed a small covered jar placed beside the plants, the seed of which was ripening; this was

intended to attract the attention of the gardener as he might pass and remind him to gather the seed as fast as it ripens without bringing it in-doors. Herr Leichtlin complains, with justice, of the practice in many botanic gardens of keeping valuable seeds for months before distributing them. It is well known that many seeds if not sown in autumn, or as soon after they are ripe as possible, will either not germinate at all or not until from one to two years after planting, long before which time the pots or pans in which they are sown are covered with moss.

If Himalayan collectors, especially, would remember this, we would not have to lament the repeated failure to grow such fine plants as *Primula Elwesiana* and *Gentiana stylophora*, which at present are two of Herr Leichtlin's special desiderata. I found that though he may not be able or even willing to imitate the natural conditions of plants, he is always desirous of knowing as much as possible of these conditions. And he agrees with me that a knowledge of physical geography in connection with plant distribution is highly useful. It is a curious and a gratifying fact that Herr Leichtlin seems to have more correspondents, and to find more gardeners of congenial tastes in England and in the United States than in his own country. I would advise any one who may have a really fine, new or rare and possibly hardy plant which he cannot propagate, to send it to him.

Preston, Cirencester, England. *H. J. Elwes.*

October in the Pines.

NO frost has yet touched the Pines, and the flowers and foliage were never more beautiful than now. The ripened leaves of many shrubs and trees are as handsome as gaily colored blossoms. The flowers linger, many summer-blooming plants throwing up side shoots from the old stems.

In my wild garden, where I am trying to imitate Nature in the Pines, blue Violets are in blossom, and so is *Oxalis violacea*, as if trying to blend spring with autumn. Most of the Golden-rods have faded, but *Chrysopsis Marianna* is still beautiful, and some of the wild Sunflowers are a mass of bloom. The wild Asters are charming. *Aster Novæ Angliæ* is in its prime. In a damp spot in the Pines I came across a variety with rose-colored flowers which were more beautiful and showy than those of the normal purple color.

The water in the shallow, muddy ponds and bogs is still warm enough to keep the Pond Lilies in bloom. But there are no flowers on any other water plants except Utricularia.

The foliage of the rare local *Helonia bullata* is beautiful now. Parting the thick clump of glossy, shining leaves, I find the embryo flower-buds. Last spring there were no blossoms. Owing to the mildness of the winter the flower-stems started up in February and March and were cut down by frost. The leaves are evergreen, and grow in a thick mat, as if to protect the incipient flower-buds; but the flower-stem is very tender, and as it is sure to push up on the first mild days of spring it is almost as sure to be nipped by frost.

The foliage of the Sweet Gum (Liquidambar) makes a fine appearance during these mild October days. Some of the trees are of a purple shade of color—deep, dark purple on the upper surface of the leaves, but on the under side still green. Others have yellow leaves; but the larger proportion of the trees have red leaves, in varying degrees of intensity of color. I have noticed year after year that each tree always takes on the same color. For instance, if it is yellow one year, we may be sure that it will be the same ever after.

But the charm of the Pines at this season is the Tupelo (*Nyssa aquatica*). Its bright crimson foliage and its peculiar habit of growth—flat, spray-like branches—make it pre-eminently the queen of the region. It does not take kindly to transplanting. I have made several attempts to have small young trees transferred to my garden, but they have all died, some quickly, others gradually. But the tree is worth many more trials, and I still hope for final success.

The next best thing in this latitude in the way of autumnal coloring is the Sassafras, which is a rapid grower. Like the Liquidambar, the trees vary in tints—some take on yellow, others red. A group of a dozen or more in my garden are now all ablaze in bright orange-red.

The deep green Hollies mingling with these bright colors make charming pictures. There are places here and there in the Pines of such wonderful beauty at this season that no words can do them justice. Less than thirty years ago this town, with all its outlying farms, was covered with a growth of some of the most beautiful trees and shrubs. These were all cut down, and attempts made to grow ornamental trees from the nurseries, many of which are a complete failure. Vineland is a standing proof of the blindness of our people to true artistic surroundings. From the teachings of Garden and Forest the more cultured class are beginning to see the mistake; but many of these trees, like the Oaks, and especially the Holly, are of such slow growth that our impatient people, who want quick results, are deterred from replanting.

On the place which I now occupy, several Hollies were planted twenty-five years ago. The largest is less than fifteen feet in height, about twelve feet across the lower branches, and fifteen inches in girth. The trees had not been cared for and had been badly mutilated. The lower branches had been trimmed off four and five feet from the ground, and many of the remaining branches had been broken for winter decorations. A near neighbor planted a Holly-tree about the same time that these were set, and this one tree is worth more than my seven. Its branches touch the ground, and it has been headed back just enough to make it symmetrical without giving it a stiff appearance. It measures nineteen inches in girth, and is about eighteen feet high and fifteen feet broad. It is far more beautiful and effective than a group of Norway Spruces which stand a little distance from it.

Vineland, N. J. *Mary Treat.*

New or Little Known Plants.

Two American St. Johnsworts.

THE genus Hypericum contains a number of shrubby North American species of considerable value as garden-plants. They are little known, however, to gardeners, and a few, at least, have probably never been cultivated. All the plants of this genus have bright and abundant golden yellow flowers, and the fact that they bloom in midsummer or in early autumn when other shrubs are not in flower, and that they continue to produce their flowers in succession during several weeks, adds to their interest and value. *H. aureum*, of which a figure was published in this journal (vol. ii., p. 185), is a small ornamental shrub of the first class from an ornamental point of view, which was introduced into gardens a few years ago through the Arnold Arboretum. *H. Kalmianum*, figured on page 112 of the present volume of Garden and Forest, is an older inhabitant of gardens. It was discovered on the banks of the Niagara River, one of the few stations where it is known to occur, by the Swedish traveler Kalm, who visited America about the middle of the last century; and it is 130 years since it was first cultivated in England. Like many of the plants of the eastern part of this continent, which were much sought after and valued by gardeners 100 years ago, it was afterward neglected with a change of fashion in gardening, and finally forgotten outside the limits of a few botanic gardens. It is getting to be understood, however, now that some of the most beautiful trees and shrubs belong to our eastern flora, and that they are the safest and therefore the most desirable plants to use in this part of the country; and American Hypericums, like the Viburnums, Dogwoods, Roses and other eastern American shrubs, now seem destined to gain the place in American gardens to which their hardiness and beauty entitle them.

Figures of two of the shrubby Hypericums appear in this issue, *H. prolificum* and *H. densiflorum*, and it is proposed to figure from time to time such of the other little known species as are likely to prove desirable as garden-plants.

*H. prolificum** (Fig. 66) is a stout, bushy plant growing to a height of three or four feet by as much in diameter, with stout erect stems and branches covered with light red-brown bark separating readily into thin scales, and slender two-angled branchlets. The leaves are nearly oblong, obtuse or acute at the apex, terminated by a minute mucro, and narrowed at the base. The numerous flowers, which are often an inch and a half across, are produced in great profusion in single or compound terminal clusters. They open in succession and continue to appear almost continually from July to September.

H. prolificum is not a rare plant, and is widely and quite generally distributed from New Jersey to Minnesota and

* *Hypericum prolificum*, Linnæus, "Mant.," 106.—De Candolle, "Prodr.," i., 547.—Coulter, *Bot. Gazette*, xi., 84.—Watson & Coulter, "Gray's Man. N. States," ed. 7, 93.

southward to Alabama and Arkansas. It was cultivated as long ago as the middle of the last century; but when found now in European gardens it appears to be grown under the name of *H. Kalmianum*. It has inhabited the Arnold Arboretum for several years, having been first received from Woolson & Co., of Passaic, New Jersey. It is perfectly hardy here, grows rapidly in ordinary garden soil, and flowers regularly and profusely every summer.

H. densiflorum † (Fig. 67) is a rarer and less known plant than *H. prolificum*, to which it is closely related. It attains a height varying from two to six feet, with stout stems divided above into many slender erect branches covered with leaves which are linear-lanceolate, with slightly revolute margins, and which are tipped with short stout mucros. The numerous flowers, which are rarely more than half an inch in diameter, are crowded in broad, compact cymes. The capsule is short and remarkably slender, and serves, as do the smaller flowers, to distinguish this species from *H. prolificum*, which it often resembles in certain New Jersey forms in the shape and breadth of the leaves, which are sometimes almost as broad as those of that species, and which have sometimes caused it to be considered a variety of it.

H. densiflorum is found from the Pine-barrens of New Jersey to Florida, Kentucky, Arkansas and Texas. It was received at the Arboretum last year from Kelsey Brothers, now of Linville, North Carolina, and flowered sparingly in August of the same year and profusely during the present season. It promises to be perfectly hardy and to become an interesting and beautiful garden-plant. *C. S. S.*

Some Recent Portraits.

THE October number of the *Botanical Magazine* contains a portrait of *Nepenthes Curtissii* (*t.* 7138), a tall-growing, stout, Bornean species of comparatively recent introduction. The pitchers, which are the only ornament in these plants, are described as eight to ten inches long by two wide, nearly cylindrical, but narrowed toward the base, yellow-green in color and mottled and marbled with red-brown. The fringe which surrounds the orifice is half an inch broad, brown, and faintly striated with a denticulate margin.

There is a good figure of *Vanda Amesiana* (*t.* 7139), already noticed more than once in this journal. The native country of this handsome plant, Cambodia, is now first made known. The delicious fragrance of the flowers, their chief charm, is hardly sufficiently emphasized; and the editor has overlooked the fact that the species was named in honor of an American Orchid-lover whose collection of these plants is not surpassed by any other.

There are figures of *Iris Danfordiæ* (*t.* 7140), a pretty yellow-flowering species of the Cilician Taurus, and of *Clerodendron paniculatum* (*t.* 7141), a widely distributed shrub in eastern Asia, "and a great ornament whether in the jungle or in gardens"; and of a showy East India Orchid, *Saccolabium bellinum* (*t.* 7142).

In the *Gardeners' Chronicle* of October 4th there is a figure of *Lilium Henryii*, the new Chinese Lily, which resembles the Tiger Lily in the shape and size of the flowers. It has, however, broad leaves like those of the Japanese *L. auratum*, and does not produce bulblets in their axils like the Tiger Lily. The perianth-segments are less imbricated than those of that species, and are bright yellow, with a few minute reddish brown dots and a few large basal papillæ. This is one of the many interesting plants discovered by Dr. Henry in western China. *L. Henryii* flowered at Kew during the past summer, bulbs having been sent by the Superintendent of the Hong-Kong Botanic Garden.

The colored plate in *The Garden* (London) of October 4th is devoted to *Gardenia Stanleyana*, a beautiful plant from west tropical Africa rarely seen in gardens, although it was introduced early in the century through the efforts of the Earl of Derby, who sent a collector to explore upper Guinea botanically. It is difficult to understand why such a desirable plant should ever have been allowed to disappear from gardens, for certainly few stove plants produce more beautiful or more fragrant flowers. These are nine inches long, with a long slender tube and five-parted limb fully three inches across when the flower is fully expanded. The exterior of the tube is deep, rich, vinous purple, while the upper or inner surface of the limb is pure white, covered more or less completely with oblong dots arranged closely in lines, the interior of the corolla-tube being of the same color as the exterior. The texture of the flowers is thick and fleshy, and they emit a powerful fragrance. Three other species of west African Gardenias have been cultivated at different times, and all are desirable stove plants. Being natives of one of the hottest and moistest regions of the world, they only thrive in the stove, where they require rich soil and abundant water and sunlight.

Judged by the beautifully colored plate published in the issue of the *Revue Horticole* which appeared on the 1st of October, an east Asia herbaceous vine, discovered by the Abbé David and described by Carrière as *Vitis rutilans*, must be an exceedingly attractive plant. Its principal beauty is due to the brilliant bright red subspinescent hairs which beset the stems and appear also on the buds, tendrils and on the principal veins of the young leaves, which are covered on the lower surface with rose colored pubescence. The mature leaves are deeply cordate at the base, scarcely lobed and provided with stout spinulose teeth; they are large and thick, lustrous on the upper and glaucous on the lower surface. The male flowers, which are the only ones described, the female plant not being in cultivation, are produced in large clusters and are bright red and nearly scentless. *Vitis rutilans* is one of the earliest of all the vines grown about Paris to begin its growth in the spring, and the young shoots are developed before any of the wine Grapes show any indication of starting into growth. According to Monsieur Carrière, "*Vitis rutilans*, to speak generally, has, as an ornamental plant, two distinct phases, one vernal, due to the brilliant coloring of its parts, the other to its large rich foliage, which it produces until the appearance of frost, and which makes it one of the most ornamental plants yet known, especially for covering arbors or ruins, or for hiding walls and other unsightly objects."

† *Hypericum densiflorum*, Pursh, "Fl. Am. Sept.," 376.—De Candolle, "Prodr.," i., 547.—Coulter, *Bot. Gazette*, xi., 84.—Watson & Coulter, "Gray's Man. N. States," ed. 7, 93.
H. galioides, Pursh, *l. c.*, 376, not Lamarck.
H. prolificum, var. *densiflorum*, "Gray's Man. N. States," ed. 5, 84.

Foreign Correspondence.

London Letter.

AN exhibition of fruit grown in the British Isles was held on the first three days of this week in the Guildhall, London. The place was as novel as the exhibition was imposing; probably in no exhibition hall or tent in England or elsewhere has there been so extensive and meritorious a collection of apples and pears. There were 4,500 dishes of fruit, and they occupied 7,000 square feet of tabling. Notwithstanding the reported failure of fruit crops this year the exhibits were generally excellent. Dr. Hogg, the venerable master in fruit knowledge, declared that "in no fruiterer's shop in London, where the best obtainable specimens are procured from various parts of the world, could such apples be found as those represented in hundreds of dishes at this exhibition."

With a view to promote the general cultivation of hardy fruit the Company of Fruiterers of the City of London decided to offer prizes for collections of fruit to be exhibited at the Guildhall, and nearly a thousand pounds were set apart by the Company to cover expenses. No charge for admission was made; on the contrary, tickets of invitation were distributed freely. The result was that about 50,000 people visited the exhibition.

Exhibitors were classified in such a way as to make the competition as fair as possible. As growers in some portions of England are much less favored by nature than are others, the country was divided into three zones—namely, northern, south-western and south-eastern. There were also sections for cottagers and for small tenant farmers, while nurserymen were separated from amateurs and gardeners. Another special section consisted of growers within a radius of seven miles from the Mansion House.

Amongst the best of the apples exhibited were Gravenstein, represented by many dishes of large, well colored fruit; Ribston Pippin, good average fruit, much better than the unfavorable summer could have been expected to produce; Warner's King, Stirling Castle and Peasgood's Nonsuch. Of the last named there were many magnificent examples, and a dish of them shown by Mr. S. Barlow, of Manchester, famous as an Auricula-grower, was declared the finest dish of apples in the exhibition. There were five fruits in this dish, and they weighed nine pounds two ounces.

Pears were not of such uniform excellence as apples, although there were no really poor samples. The best of them included such proved sorts as Marie Louise, Beurré Superfin,

Louise Bonne, Beurré Diel, Pitmaston Duchesse, Doyenné du Comice, Glou Morçeau, Fondante d'Automne, etc.

With the Fruiterers' Company, the British Fruit Growers' Association and the Royal Horticultural Society earnestly at work as they are, the capabilities of England as a fruit-producing country ought to be fully tested.

MANURE FOR ORCHIDS.—I once asked a famous Orchid-grower his opinion of the wisdom of those growers who recommended the use of strong soils and manures for various Orchids. His reply was: "They may or may not be right; but of one thing I am certain, every Orchid without exception may be grown in peat or sphagnum, or the two combined." Professor Reichenbach was opposed to the use of manure in any form for Orchids, and I will remember his warning when he saw cow-manure water being used in our Orchid-houses for damping down in the evening. But it was long ago proved that for such Orchids as Pleiones, Phajus, Calanthes and similar terrestrial Orchids, manure is beneficial. Mr. Moore, of Glasnevin, has gone much further than this, and has used it for many epiphytal kinds with almost invariably good effect. In a paper which he prepared for the Scottish Horticultural Association, Mr. Moore relates his experience in testing Orchids with a chemical manure known as Fish Potash. This he used for various species of Cypripedium, Dendrobium, Cœlogyne, Lycaste, Maxillaria and Sobralia, all of which were so much benefited that he determined to make further experiments—fish-potash guano becoming "a regular article on the Orchid-bench at Glasnevin." He found that *Anguloa Clowesii* and *Houlletia Brocklehurstiana* showed most marked improvement in growth when fed with this manure. The Houlletia, he says, "has always been more or less a puzzle to Orchid-growers. Some grow it cool, some warm, and but few really succeed with it—that is to say, succeed in growing and keeping for any considerable period nice, healthy, flowering specimens, and I confess I had not been one of these; in fact, I despaired of getting it to grow in a satisfactory manner. But

Fig. 66.—Hypericum prolificum.—See page 524.

a change came over it as soon as I commenced to manure it, and I have no difficulty in growing and flowering Houlletias now." All Cypripediums made better growth when fed with this manure than when grown in ordinary soil. After three years' careful experiments Mr. Moore concluded that "the continuous use of fish manure is beneficial to Orchids; the benefit is not equally apparent each year; and lastly, the beneficial effects are most marked during the second and third years. At the third year the plant seemed to attain the maximum size of leaf and pseudo-bulb, and during the fourth and fifth years all I could do was to maintain the standard of excellence arrived at during the third year, but there was little difficulty in doing this when a little manure was used and ordinary precautions observed. I made certain that the annual addition of manure was necessary by withholding it from about half a dozen plants which had been previously supplied with it. These remained healthy, but they did not grow as freely—that is, the new growths were not so large as the older growths, and the number of breaks were not so numerous; in fact, they evidently missed the manure." The growth made under the influence of manure was sound and healthy, and the production of flowers excellent. Mr. Moore recommends the following precautions in using this manure for Orchids—namely: Give it in small quantities, and only once a year; mix it well with the soil, or, in the case of plants not to be repotted, raise the sphagnum and scatter the guano over the soil.

Fig. 67.—Hypericum densiflorum.—See page 524.

I have referred to this subject and quoted Mr. Moore at some length, because I know him to be a first-rate Orchid-grower and a keen and accurate observer. The collection of Orchids, mainly formed by him within the last twelve years, is one of the most comprehensive and best managed in the British Islands.

Hardy Autumn Flowers.—Amongst the best of these in bloom now—in the second week of October—are the following: Belladonna Lily—a border filled with this plant, under the lea of a warm-house wall facing south, is covered with the tall spikes of flowers of this beautiful Cape bulb. The color varies from white, tinged with rose, to a rich rose-red; the trumpets are numerous and durable as well as beautiful; one does not hesitate to declare that this plant has no equal among hardy autumn-flowering bulbs. The Belladonna Lily requires a warm wall and it must not be disturbed when once planted, unless the bulbs become crowded.

In the same border with the Belladonnas is a large group of the rich colored Cape Irid, *Schizostylis coccinea*, with Ixia-shaped flowers. From the middle of September until the middle of November they will be beautiful, unless there is a very sharp frost; they are not affected by a degree or two, merely close their cups until the sun comes to warm them into expanding again. An edging of the autumn Daffodil, *Sternbergia lutea*, one of the brightest of yellow flowers, is beautiful in itself, and harmonizes with the rich crimson of the Schizostylis. A bed of the new *Anomatheca grandiflora* is an attraction of more than ordinary interest. Evidently, this plant will prove as useful for autumn effect as the Shizostylis, for its large rich crimson and maroon flowers come at the same time and are almost as effective.

Kew. *W. Watson.*

Cultural Department.

Tuberous Begonias.

In the absence of frost hybrid tuberous Begonias still make a brave show out-of-doors, though they have about ceased to grow and few new flowers are expanding. The exact value of these plants for bedding in this latitude is yet to be determined. Last summer with much wet weather and inclination to coolness beds of Begonias were very attractive and successful with little care. This season they do not appear to have done so well unless carefully watched and tended. My plants, at least, seemed to halt in their growth, were not nearly so floriferous and were attacked by black rust. The claim often made that tuberous Begonias are the coming bedding plants is hardly likely to prove true. In the first place they require, from the nature of their growth, more care than most people, not professional, are willing to give bedding plants, and they need selected situations with a certain amount of natural shading. Even when carefully hardened they are often burned by a fierce summer sun, and in some conditions of climate are quickly attacked by rust. But with a careful selection of varieties of dwarf growth and stiff peduncles, beautiful bedding effects may be made with these plants, and they are well worth the necessary care.

Probably no flowers suffer less from continued drenchings and no blooms are more showy. An unpleasing color is seldom or never seen among them. The improvement of the hybrid Begonias has not yet ceased. Growers are now giving their attention to strains of dwarf growth, and, with rigid peduncles, carrying flowers well above the foliage. As greenhouse flowers tuberous Begonias leave little to be desired, brightening up the house from early July to late in the year; in fact, some of the Socotrana hybrids carry the season through the winter. In the greenhouse they require all possible air and judicious shading. Hitherto we have had no fragrant tuberous Begonias, but a species has been collected in South America whose flowers have a distinct and agreeable fragrance. This Begonia, known as *B. Baumanni*, will probably enable hybridizers to give us a race of hybrids in which perfume will give a perfect charm to the admirable blooms.

Besides the hybrids with great showy blooms, some of the smaller blooming species are now specially attractive. *B. geranioides*, from a low cluster of round leaves, throws up numerous racemes of dainty flowers, whose pure white is accented by a dot of golden stamens. The plant has a curious resemblance to a Pelargonium, and is from Natal, as is also *B. Natalensis*, which has been before noted in these columns as a very pleasing and distinct variety with small dark orange flowers and metallic green foliage. *B. Martiana grandiflora*, *racemiflora* and *diversifolia* are three varieties of *B. gracilis* which can be recommended to all lovers of dainty beauty in plants. From the tubers are thrown numerous gradually lengthening stems, on which expand a succession of pink flowers, producing an effect as unique as it is pleasing. *B. Martiana* is an old introduction from our south-west border or northern Mexico, I believe, but is even yet apparently not well distributed.

Elizabeth, N. J. *J. N. G.*

The Newer Gladioli.

Last year much was said in the papers about a strain of Gladioli which had been produced in California, but I am sorry to say that these sorts, of which I had formed such high expectations, are not what we consider very good flowers in the vicinity of Boston. None of them withstand the sun better than our ordinary kinds; none of them have flowers above the ordinary size; none of the flowers have colors or shadings which would cause particular notice. Shasta is the best one, and is of that type of which there are so many—white, marked with rose.

The new strain raised by Lemoine, of Nancy, France, is a noble addition to our resources. He calls them the Nanceianus strain, and says they are raised from the ordinary Gandavensis sorts, fertilized with *G. Saundersi*, and their appearance confirms it, for they have much of the peculiar shape and marking of that species. I tried the same cross some years ago and got insignificant and inferior flowers, which shows that some hybridizers are more expert than others. These flowers are very large, surpassing, in fact, the promised size of the California strain. The largest is President Carnot, some of whose flowers I found to have a breadth of six inches. None of them can be said to be very good in color, but not only that, but the size of spike will be greatly improved now that the break has once been made.

I wish also to advocate the claims of some of the hardy Gladioli. Last fall I planted several hundred of these, which I covered with leaves and corn-stalks. As far as I could judge every one came up and bloomed to my complete satisfaction, beginning about June 15th and continuing to come forward in the several sorts up to the end of July. The earliest was *G. Segetum*, a species attaining a height of two feet, and producing rosy purple flowers of good size, adorned with white central stripes on the lower petals. Next came *G. communis*, with colors like the last, but with flowers of different shape and of longer duration. Then *G. Colvillei*, and *G. Colvillei albus*, or Bride, the first purple and straw, the other a beautiful white, opening with a creamy tint in the centre, which soon bleaches as white as snow. Many varieties of *G. ramosus* (a hybrid, as is also *G. Colvillei*) were conspicuous, their colors being the most vivid scarlet, crimson and rose, generally with white markings. My favorites, however, among the hardy kinds are what are called Nanus varieties, which have been produced by Dutch bulb growers by crossing many dwarf species. These only attain a height of ten or twelve inches, but their flowers are most delicate and exquisitely soft and tender in tint. They deserve to be largely grown for bouquets, for which their size and lovely colors so well adapt them.—*W. E. Endicott, in Popular Gardening.*

Cypripedium Morganiæ.

As far as raising artificial hybrids among Lady-slipper Orchids is concerned, the culminating point of the hybridist's art may for the present be looked upon as embodied in *Cypripedium Morganiæ*. This magnificent addition to the floral world appeared ten years ago in Messrs. Veitch's nursery, Chelsea, through the agency of their foreman, Mr. Seden, who in his time has contributed many other beautiful hybrids to our Orchid-houses. The plant was raised by fertilizing the stigma of *C. superbiens* (otherwise known as *C. Veitchianum*) with the pollen of the distinct and robust-growing *C. Stonei*, and was named in compliment to the late Mrs. Morgan, of New York, who took much interest in the great Orchid family. The parents of *C. Morganiæ* are by no means of a delicate constitution, but their offspring may be said to be as vigorous as both of them put together, if I may be pardoned for using a phrase tainted with Hibernian proclivities. Indeed, *C. Morganiæ* may be considered as one of the very strongest growing Cypripediums in cultivation, and this fact, in connection with its large and handsome flowers—which (with the exception of *C. Stonei platytænium* perhaps) are the largest in the genus—has led to its extensive propagation, so that one frequently sees it. Perhaps the finest specimen of Mrs. Morgan's Cypripedium is at present in the equally fine collection of Baron Schröder, near Staines. At a meeting of the Royal Horticultural Society in August last spikes were exhibited from this plant bearing as many as four and five large flowers, a number hitherto unsurpassed in its history as far as I am aware. The broad, strap-shaped leaves are a foot or more long, bright green, with darker green transverse narrow bars. The large upper sepal is creamy white, flushed with delicate rose at the sides, and longitudinally traversed by seven or eight broad, deep purple lines. The lower sepal is somewhat

smaller and with fewer purple lines. The broad, drooping petals are between four and five inches long and are fringed with grizzly blackish hairs on the margins, while the surface, which is olive-green just at the base, passing into pale yellowish white, is densely covered with large irregularly shaped blotches, these being purplish pink on the anterior portion and dark purple at the base, the difference in their color being due no doubt to the variation in the ground color. The pouch is very large and pointed, and may be described as purplish pink at the end and gradually softening into rosy brown under the edge of the mouth. The inflexed basal lobes are creamy white, spotted with purple, and the large shield-like staminode is buff-yellow and pubescent.

Last year a variety known as Superbum appeared in the collection of Sir Trevor Lawrence, having been raised from the best varieties of *C. superbiens* and *C. Stonei* obtainable at the time of crossing. This variety is characterized by having more highly colored flowers, and slightly shorter, broader and more heavily blotched petals than the ordinary variety. It is finely figured in the last issue of *Reichenbachia*.

As mentioned before, *C. Morganiæ* is a very vigorous grower, and consequently may be easily cultivated. It likes a tolerably warm and moist house, and may be potted in a compost of fibrous peat and loam in about equal proportions. Water may be freely given during growth, and more or less frequently at other times, except in very dull and cold weather, when little will suffice.

Isleworth, London. *John Weathers.*

A Few Flowering Plants.

Rogiera gratissima is a useful ornament for the intermediate house, or warm greenhouse, and deserves to be more widely known and grown; for though this plant has been in cultivation for many years it has not yet become common. It might be described in a general way as being the cool-house representative of the Ixora type of decorative plants, the Rogieras also belonging to the *Rubiaceæ*, as do the Ixoras, though the former are found at much greater elevations than the latter.

Rogiera gratissima is a hard-wooded shrub with simple, opposite leaves of bright green, and terminal clusters of pink flowers which have some resemblance to those of a Bouvardia. The flowers are fragrant and last fairly well when cut, and as they are freely produced at intervals during both summer and winter, the value of this plant will readily be seen. *Rogiera gratissima* is propagated by means of cuttings, which should be made of firm growth; for instance, from short side shoots that are about half ripened. The cuttings require a rather close atmosphere until they become calloused, after which they soon produce roots, and may be potted into a light mixture consisting of two-thirds good loam to one-third peat, to which should be added a liberal supply of sand. As the plants become larger a similar mixture should be used for potting them in, but the compost should be coarse and well drained.

Another fine flowering plant is *Dalechampia Roezliana rosea*; it is seldom seen, though easily managed and decidedly ornamental. This Dalechampia is very useful in small plants, as its striking inflorescence shows to good advantage. It is a native of the West Indies and enjoys a warm and moist atmosphere; under such conditions its growth is rapid, the most satisfactory plants being those grown from seeds, which germinate quickly when placed in a warm house. The chief beauty of this plant is found in the bracts surrounding the flowers, these being quite large and deep pink in color, while the flowers are yellow and rather insignificant. The leaves are from five to six inches in length and have a peculiar drooping habit.

Dalechampia Roezliana rosea seeds freely, but the seeds should be gathered as soon as they are ripe, for mice have a special liking for them. As regards soil, the Dalechampias are not specially fastidious, almost any light, rich compost being suitable, provided there are the necessary conditions of warmth, moisture and moderate shading; at the same time proper attention should be given to the drainage of the pots, as these plants will not grow well in sodden soil.

Posoqueria longiflora is a fine hard-wooded stove plant from Guiana, and well deserves its specific name, for the tubular white flowers are much elongated, and may be described as having the appearance of a large Stephanotis flower with an abnormally long tube. The leaves are somewhat ovate in shape and dark green in color; the plant grows in bush form, and ultimately becomes a small tree. It makes more progress in a warm-house, but may be grown in a temperature of fifty-five degrees, providing it is not over-watered. *Posoqueria longiflora* is propagated by cuttings, which should be of firm young growth, and placed in a rather close atmosphere until rooted; and as this process is somewhat slow, some little care is required to prevent them from damping off. When rooted they should be potted in a compost similar to that recommended above for Rogieras, in which they will thrive if given reasonable care.

A pretty little member of the *Lobeliaceæ* is found in *Siphocampylos Humboldtianus*, a plant of South American origin, also known as *S. fulgens*. This plant bears bright scarlet tubular flowers about two inches in length, and has dark green leaves of small size, smooth on the upper surface, but more or less pubescent beneath. *S. Humboldtianus* is of shrubby habit, and needs to be pinched in occasionally to keep it in good shape. It is propagated also by means of cuttings, which may be rooted almost as readily as those of a Verbena, though not in so short a time. No special directions regarding soil for this plant are needed, as good loam is all it requires; and given a temperature of fifty-five degrees, with a little protection from full sunlight, a measure of success is assured.

Holmesburg, Pa. *W. H. Taplin.*

Notes on Shrubs.

IN view of the fact that it is likely soon to be quite extensively advertised, it may be well to note that the plant which has formerly been referred to in these pages as *Symplocos paniculatus* should properly be called *Symplocos cratægoides*; the latter is the name accepted by botanists generally and the one most commonly used. One firm of plant-dealers already have *S. cratægoides* on their lists, and it is desirable that there should be uniformity with regard to names of plants in the catalogues of nurserymen. In this instance, for example, it would be very misleading and confusing to amateurs to find a plant described in one catalogue as *Symplocos cratægoides* and in another as *S. paniculatus*, each probably with descriptions so various as to give an impression that they are different species, when they are in reality identical. All honest dealers will work toward a uniformity of names, and those who employ little used or disqualified names are usually more or less unreliable and are best avoided.

S. cratægoides occupies a unique place in the shrubbery on account of its bright ultramarine blue fruit, which ripens in September, and its innumerable small white flowers, which are produced in the last days of May or early in June, and have a very light and pleasing appearance, although much hidden by the foliage of the growing shoots. The rough, thick leaves have no very peculiar qualities of an ornamental character; they are usually clean and free from disfigurement by disease. This plant may attain the size of a large shrub or small tree, and is of rather loose and irregular habit of growth; indeed, as its specific name indicates, the general appearance of the plant in some respects is much like some of our smaller species of Cratægus or Hawthorn, although the flowers and fruit differ widely. The thin fleshy portion surrounding the seed of the fruit is rather dry and unpleasant to the taste, while the seed is strongly pungent or almost acrid; but birds, especially robins, seem very fond of it. *S. cratægoides* shows considerable variability in cultivation in regard to vigor of habit, quality of foliage and coloring and maturing of fruit.

This tendency to vary is also shown in herbarium specimens from different places where the plant has been found, and it appears to have a wide distribution in northern India, in China and in Japan. Victor Jacquemont, in his celebrated Oriental travels, found the plant at an elevation of from 7,500 to 8,000 feet, and in his "Voyage dans l'Inde" (atlas, tab. 110) is given the only figure which appears to have been published. It is drawn by the eminent artist Riocreux, and represents a flowering branch and analyses of the flowers, the mature fruit being at that time apparently unknown. The description (vol. iv., p. 103) was furnished by Decaisne, who called it *Lodhra cratægoides*. The name "Lodhra" is said to have been derived from the Indian word "lodh" applied to this and another species (*S. racemosa*) from which a yellow dye is procured. Lodhra was first used by D. Don to designate a section of the genus; later it was given a generic place by Decaisne; Bentham and Hooker include it under the old generic name of Symplocos.

In striking contrast to the bright blue fruit of this Symplocos we have the snow-white berries of *Symphoricarpus vulgaris* and the bright scarlet color of the native Hollies or Winterberries. Of the latter, the Smooth Winterberry (*Ilex lævigata*) is the earliest to ripen fruit, and it begins to turn red about the same time that the first fruit of the Symplocos changes from green to greenish white and then blue.

It has been stated in botanical descriptions that the berries of *I. lævigata* are larger and less bright than those of the

common Winterberry or Black Alder (*I. verticillata*). This certainly does not appear to be the case in cultivation; the fruit of *I. lævigata* is little if any larger, and although it is less abundant, its color is quite as bright and rich a scarlet as that of the other species, and it ripens from two to three weeks earlier. The foliage is smooth and glossy, giving the whole plant, when in full fruitage, a very showy and attractive appearance. The leaves of *I. verticillata* are rougher and more deeply serrated and are not so glossy. The fruit is more abundant, and probably the dense, short, axillary clusters, which almost encircle the branches, gave rise to the rather misleading name of "verticillate," or whorled.

Although these two species have strong resemblances, they each have distinct and constant characters by which they may be readily identified. Both form erect, compact bushes under cultivation. For general purposes in ornamental planting, *I. verticillata* is probably the most valuable, as its more abundant fruit remains in good condition for the longest time in the autumn and winter.

Arnold Arboretum. *J. G. J.*

Kniphofias from Seed.—The smaller growing kinds of Kniphofia, such as *K. Macoweni*, produce seed freely and ripen it much better than those that flower later. *K. corallina*, *K. nobilis* and *K. Saundersii* are, I believe, all of garden origin, and, when obtained true, are among the best of the older and tried varieties. One European grower is said to have as many as sixty kinds in his grounds. I would advise those who have raised these plants from seed not to place much reliance on their being true to name, as these Torch Lilies, so conspicuous in the garden, are equally so to bees and other insects. Where more than one kind is grown it is impossible to get any variety true from seed, though there is the possibility that one may raise plants of more value than the parents, as I have done on more than one occasion. I have not seen a better kind than *K. corallina*; it is the most constant bloomer of all, commencing soon after midsummer, and it continues until frost. The spike is very dense and compact; in habit it is intermediate between *K. aloides* and *K. Macoweni*. These plants are indispensable in a well arranged flower border. In the eastern states none are hardy, though some may live out-of-doors through a mild winter, but it will take a season for them to recover and to flower again. It is a simple and safe plan to lift the roots and cut off the tops to within twelve inches and winter in sand in a cool cellar. They should be taken out early in spring, before they begin to grow, and planted in rich soil. These plants well repay liberal treatment.

South Lancaster, Mass. *O.*

Lælia Eyermaniana.—During the months of July, August and September plants of this attractive Lælia may be met with in various collections showing their flowers. At present it is little known, owing chiefly to the fact that there are not a great many plants in cultivation, and also because it has only been introduced about two years, having been imported in 1888 by Messrs. Sander & Co., of St. Albans, with a consignment of *Lælia majalis*. It is generally supposed to be a natural hybrid between this latter species and *L. autumnalis*, and there is every reason to believe that such is the case, inasmuch as it is impossible to distinguish the pseudo-bulbs of *L. Eyermaniana* from those of *L. majalis*, while the flower is intermediate between the two species as far as structure and markings go, but, curiously enough, is much smaller than either *L. majalis* or *L. autumnalis*, a fact which seems difficult to explain. Last year I saw about a dozen plants in flower at one time, and there was little or no variation to be noticed in them, except in the number of blooms borne on the peduncles, some of which bore as many as ten and twelve flowers, while others had as few as three and four. The ovate-acute sepals and rhomboid-acute petals are of a clear rose-purple, the sepals being remarkable for having a greenish knob at the tips. The erect lateral lobes of the lip are white, with divergent lines of violet or purple spots on the inner surface, while the broad, obovate-apiculate front lobe is dark rose, with deeper colored veins on each side. On the disc are two elevated, violet-spotted keels, which become constricted about midway, then open out again, when a third yellow keel appears between them. The slightly curved column is pure white, except at the base, which is pale yellowish green, spotted with violet. The pseudo-bulbs are ovoid, more or less wrinkled according to age, and have two or three deep green, oblong, leathery leaves, about six inches long on the summit, both leaves and bulbs, as before mentioned, resembling those of *L. majalis*.

As years go on, and *L. Eyermaniana* becomes more plentiful, one may expect to meet with it more frequently than at present, especially as it produces its flowers freely and retains them in a fresh condition for several weeks. The plants are best suited for basket culture, and may be suspended near the roof, so as to obtain plenty of light. They will thrive in a cool house, although it is beneficial if a slight increase in the temperature be made when they first begin to push their young growths, the strength of which must act as a guide for the amount of water to be given. A cool, dry atmosphere will be found to keep the flowers in greater perfection than a warm, moist one, which soon causes the flowers to be spotted.

The specific name is given in compliment to Mr. J. Eyerman, of Easton, Pennsylvania, who, I believe, has a splendid collection of Orchids.

Isleworth, London. *John Weathers.*

Amaryllis Belladonna.—The beautiful Belladona Lily, as it is popularly called, flowered with me this autumn for the first time. Early in the spring I purchased a few strong bulbs, which I planted in the latter part of May in rather poor sandy soil near the wall on the south side of my house, where they have all the sun-heat necessary for their development. Early in September the largest bulb pushed up a flower-stem which reached a height of about twenty-two inches. It was dark reddish brown in color, overlaid with a delicate light bloom, like that on some grapes. The flower-buds were rosy red, and the flowers at the time of opening light rose with a yellowish white throat, changing to dark rosy shades on the second day. There were eleven flowers in the umbel, and each one lasted in full beauty more than a week. This umbel of well opened flowers, glittering in sunshine as if sprinkled with ice, was a beautiful sight to look at. The perfume of the flowers was sweet and spicy. In the northern and eastern states the Belladonna Lily must be grown in pots, as it will not endure in the open air the rigors of our winter climate. It would be interesting to know if this plant succeeds in the open air anywhere in the south. I tried to grow it in Florida, where the soil is sandy, but without any marked success. Apparently, the heavy rains there in summer, when all these plants are resting, are fatal to their health.

The home of *Amaryllis Belladonna* and its varieties is in the south-western part of the Cape of Good Hope, where it grows in great abundance. *A. blanda*, which is described in the excellent "Hand-book of Amaryllideæ," by Mr. J. G. Baker, as a variety of *A. Belladonna*, appears to me to be a good species, the bulbs being larger, dark brown and egg-shaped, while those of *A. Belladonna* are brownish gray and nearly globular. The flowers of *A. Belladonna* are more open, rosy white and more fragrant. The so-called *A. Hallii*, which I have always supposed to be near *A. Belladonna*, is now referred by Mr. Sereno Watson (Garden and Forest, vol. iii., p. 176, Fig. 32) to a distinct genus, Lycoris. In addition to this species, *Lycoris squamigera*, I have in cultivation *L. radiata*, *L. radiata Terracciniana* and *L. aurea*; none of these, however, have flowered yet.

Milwaukee, Wis. *H. Nehrling.*

Correspondence.

Kansas Farmers and Kansas Forests.

To the Editor of Garden and Forest:

Sir.—Though Kansas possesses no timbered area that, for extent or density, will compare with the forests of the eastern or middle states, there is a considerable extent of country along the eastern border which was originally well clothed with trees—in the bottoms a heavy and valuable growth, on bluffs and uplands a scattering stand of scrubby Oaks and Hickories. Farther west the timbered area is narrowed and confined more closely to the streams, and beyond the junction of the Blue with the Kansas River the last wooded hills are seen. Beyond this point the trees on the slopes of the bluffs disappear, and only the banks of the streams and the lower benches are wooded. Before the head waters of either of our larger western rivers are reached, the last solitary Cottonwood or Elm will have been passed and the Buffalo Grass and the Blue-stem are masters of the field.

The trees are not keeping their bounds without attempting to acquire territory, and every rod of soil where the fires cannot sweep is sooner or later covered with timber. A bend of a stream nearly surrounding a bit of bottom land affords the best chance for an advance if the fires are prevented from entering from the unprotected side. Where natural conditions or the care of man afford this protection we soon find those advance guards of forest-growth, the Sumach and the Dogwood-bushes, springing up among the Blue-stem Grass. Before long from the midst of these thickets young Oaks, Walnuts and Elms shoot up, and in a score of years form a handsome

grove. Out along some narrow ravine or draw leading down from the bluffs the trees push their way, year after year, where fires have failed to reach them. Then comes a wet season, with an unusual growth of Grass, a dry day, with the wind in just the right direction, and the fire sweeps down, deadening the young growth back nearly to former limits. But the sturdy roots are left alive, and the contest is renewed till, at length, the trees overshadow and drive out the Grass, and so deprive the fire of fuel.

With the general settlement of the country came the steam saw-mill and the demand for all grades of native lumber, as well as for thousands of loads of stove-wood. Many of the owners of timbered lands, reckless of the future, sold their trees till not a valuable stick was left. The trees that stood upon the land of a non-resident or upon state or school lands were chopped and plundered by day and by night. Cases could be cited in some of the western counties where a fine growth of Red Cedars was so completely cleared from the bluffs that neither stumps nor roots now remain in the chalky declivities to give a hint of the verdure that once covered them. Kansas pioneers dealt with the scanty growth of timber they found with the same reckless disregard for the future which led to the extermination of the White Pine farther east. Those who settled first and secured timbered claims had more than enough wood for their needs; the prairie homesteader had none. It is perhaps not just or consistent to blame too severely these early pioneers who came to the state often with little besides the team and wagon which brought them. With the nearest railroad station fifty or a hundred miles away, where Pine-lumber of poor quality could be had only at enormous prices, it was natural that as much as possible of the native timber should be turned to account. But there is a waste and destruction of young timber taking place to-day against which the warning voice cannot be too earnestly raised. It may sound strange to speak of clearing timber land in Kansas, yet it is a fact that within a single county, during the past few years, many acres of thrifty young timber have been chopped and placed on the market as stove-wood or fence-posts. I have seen scores of young Black Walnut-trees, not thirty years old, split into rails and fence-posts, without a thought on the part of the owner that the supply of merchantable Walnut-lumber in the east and south is nearly exhausted, and that he was clearing the ground of trees which would be of great value to his children. A slaughter like this is often made to secure one more field for Corn or Wheat, and this by a man who has already more acres under the plow than he can bring to one-half of their productive capacity.

In spite of much chopping and a great deal of abuse, the timbered area of Kansas is probably greater than it was thirty years ago, though the number of trees that would afford profitable saw-logs is comparatively small. Where a wise foresight has been exercised we find valuable varieties which will soon do to draw upon for lumber. Oak and Walnut spring up readily where older trees of those sorts are established to furnish the seed. The Green Ash soon gains a footing on moist land and makes a rapid growth while young. Several species of Hickory spring quickly into valuable groves in the more eastern portion of the state. In fact, wherever trees have obtained a hold there is abundant encouragement for the man who will protect them and give them a chance.

When the farmers who own the timbered lands make it a rule to cut only mature trees or crowded and imperfect ones, except when needed for special use, thinning judiciously and preserving with care every young tree of a valuable variety; when timber-lands are as carefully guarded from fires as the stock-yards and stables, and when cattle are not allowed to tramp out the young seedlings for the sake of the scanty pasturage furnished by the woodland, the value and profit of Kansas forests will steadily increase.

We need not expect to see Kansas lumber quoted in the great markets of the nation, but we may see many domestic wants supplied by it in the way of fuel, fencing, and of the ever needful material for buildings and implements upon the farm, at a time when the hardwood forests of the southern states are no longer sold at the Government price per acre, and when the manufacturer's supplies of hardwood lumber will be more difficult to obtain than they are at present. The commercial value of this young timber is not its only importance. The benefits to be derived from a dense growth of trees and underbrush on the low bench-lands of our rapid streams, in checking the force and destructiveness of floods, is beyond computation. When the uplands were covered only with Buffalo Grass, which was burned off every year, and the draws and water-courses were destitute of a tree or shrub to check the force of the current when it left the channel, the suddenness with which an unimportant branch assumed the proportions of a navigable river can only be appreciated by a man who has been on the wrong side of one of them at nightfall, or who has, perhaps, seen his team washed down the boiling current while he was glad to cling to a friendly Elm-top and wait for the flood to run down. The replacing of Buffalo Grass by coarser and ranker varieties, the more ready absorption of moisture by cultivated fields, and the holding in check of the swollen torrent by the increased growth of trees and shrubs along the banks, have all tended to reduce the suddenness and destructiveness of the floods with which the early settler was so familiar. As a further indication of change for the better there are now many streams which flow nine months in the year where there were formerly dry channels except after heavy rains.

The future of Kansas forests must rest with Kansas farmers. Give the trees protection from fire and stock, with a little timely thinning and pruning; cut them as they reach maturity, and provide the way for others to take their places, and the woodlands will grow continually more valuable and yield a return as safe and sure as the best plowed fields.

Agricultural College, Manhattan, Kan. *S. C. Mason.*

Recent Publications.

The Art and Practice of Landscape-Gardening, by Henry Ernest Milner, F.L.S., Assoc. M. Inst. C. E. With Plans and Illustrations. London, 1890. Quarto.

The author of this book is an English landscape-gardener of experience, having begun his work as colleague of his father, Edward Milner, who was associated with Sir Joseph Paxton during his later years in all the works he then carried out. That Mr. Henry Milner's own tasks have been varied and important is shown by the references and illustrations in this book, which speak of large private places conceived and carried out by him on the continent as well as in England, and also of public gardens and cemeteries. The book is well written and handsomely printed; the plans are large in scale and printed in colors; and if the etched views had been as good in their way nothing but praise could be given to the externals of the volume. The text deals partly with general principles of taste as concerned with the different problems of the art and partly with the practical treatment of such problems.

The purely æsthetic chapters will, perhaps, do nothing to modify or enlarge the opinions or tastes of those already familiar with standard works on landscape-gardening, but they will give sound guidance to a beginner, and here and there we come across a passage where a familiar truth is particularly well expressed. For example, every one knows the generic difference between the formal gardening of Renaissance times and the "natural" or landscape method of treatment which developed in the eighteenth century. But this difference is freshly impressed upon the reader when he is shown that, while the later aim has been to simulate in a measure the aspect of untutored Nature—to bring, as has elsewhere been said, the country into the garden—the older ideal was to lay out the garden "for utility or for pleasure, with a purpose of distinguishing it from the surrounding scenery." Regularity and order then "contrasted with Nature's aspect outside," while to-day a carefully calculated irregularity and variety are made to harmonize with this aspect. Of course, the author's preference is in general for the modern naturalistic style, but it is agreeable to find how clearly he recognizes the claims of architectonic designing in certain places and cases. As in every other art, the mode of the day is apt, in gardening, to impose itself so strongly on the artist's mind and taste that he can see no good in any other mode, and instead of an enlightened adherent of the style he prefers, he becomes its unreasoning, and, therefore, often mistaken advocate. Thus, in this country as in England (and even on the continent, where one might anticipate a clearer recognition of the perennial claims of architectonic designing), we see constant errors in the treatment of small surfaces of ground and the arrangement of the areas close to dignified buildings. Tiny rectangular yards are laid out with a futile, trivial effort to obtain a "landscape effect," and palatial homes and public structures are made to look as though they had been casually dropped down on a bit of untouched ground, among trees, shrubs and grassy spaces where the presence of architectural factors had not been anticipated. From errors of this sort Mr. Milner's words should free the mind of any neophyte in the practice of his art. He perpetually insists upon the elemental fact that a large house should be supported, and its dignity and the beauty of its lines increased, by the arrangement of the levels and the planting

close about it—that, in short, something in the way of formal designing should make the transition between its formal lines and the graceful variety of the grounds further away. To make this transition well—to make the formal designing harmonize with the house on the one hand and with the true landscape passages on the other—is, of course, the most difficult of the artist's tasks; nor is it an easier task when buildings are not in question, but when, as in the case of a public park, certain elements of formality are still demanded for grandeur of effect or for convenience of public use. In learning how to treat such tasks much help, we think, will be afforded by the more practical portions of our author's text and by his plans. Especially interesting is his description of the transformation of an estate in Hungary, where he deflected a public road which passed too near the front of the old house, and arranged the ground on that side, as well as on the other sides, in what seems to be a very ingenious, intelligent and successful way. A special chapter of interest is given to "Terraces," and among the practical chapters, hot-houses, the kitchen garden and the economic treatment of land are dwelt upon, as well as those questions of arrangement and formation, of planting and of the treatment of water and of approaches, which one would be more sure to expect. Of course, certain counsels—as, for example, with regard to the most desirable trees and shrubs, lists of which are given for different soils and situations—will be of little use to the American as compared with the English student. But there is still much in the book to instruct the former, and we would especially call attention to the chapter headed "Water" as dealing with a subject usually less well understood than others. "The Approach" is another good chapter, illustrated with interesting plans. It is a question, however, whether, in the two large schemes for planting which are illustrated, the author's desire to secure variety has not led him to use too many species of trees. There is no scale appended to show the size of the intended boundary plantation, for example; but it would need to be very large, indeed, to admit, with good effect, of the introduction of the forty-four species whose names and places are marked thereon. Nor can there be many situations in which, for practical cultural reasons, it would be wise to mingle so large a variety of indigenous and foreign trees. On the whole, however, while the volume is in no sense a remarkable or very inspiring one, it can be recommended to the attenion of serious students, especially those who are not able to read the many similar treatises which exist in the French and German languages.

Notes.

The forest-fires which have raged during the past summer in the Black Hill-region of Dakota are reported to be the most destructive which have visited that part of the country since it has been open to settlement. Sixty square miles of timber are said to have been burned over.

Discoveries made not long ago near the Stabiana Gate, in Pompeii, included the trunk of a tree which an Italian savant has identified as *Laurus nobilis*. Some of its fruits were likewise found, and from their size it is now said that the eruption which destroyed the city must have taken place in November, and not, as previously believed, in August.

According to the Victoria *Colonist*, one of the largest Douglas Firs ever cut in that vicinity was recently measured at a mill in Vancouver. It included four twenty-four-foot logs, the largest of which measured seventy-six inches in diameter, and all of which were perfectly free from knots. The whole product was estimated at 28,614 feet.

The true Apples do not, as a rule, assume any decided autumn coloring of foliage. The exception is the Japanese *Pyrus Toringo*, a small hardy tree distinguished by its curiously lobed leaves, which resemble those of some species of Cratægus. These are now colored deep purple, and are very ornamental, and quite distinct from those of any other Apple-tree.

Mrs. Elizabeth G. Britton announces in the *Bulletin of the Torrey Botanical Club* that as there is a demand in the eastern states for a hand-book of Mosses smaller and cheaper than Lesquereux and James' Manual, and as, moreover, the edition of this is nearly exhausted, she is preparing an illustrated work to be called "A Hand-book of the Mosses of North-eastern America." The area denoted by the title will include eastern British America and the north-eastern and central states, and it is hoped that the volume will be ready for publication by the end of next year.

The autumn coloring of the foliage of the Japanese Negundo (*Negundo cissifolium*) is surpassed in beauty by that of few exotic trees. The general color of most of the leaves at this time is bright orange. Those at the end of the branches turn first and are brilliant scarlet, the contrast between the two colors producing a beautiful and striking effect. *N. cissifolium* is a small, perfectly hardy tree of excellent habit and pleasing color through the summer. It is vigorous, grows rapidly, and so far shows none of the constitutional weaknesses which have made many other Japanese plants of the Maple tribe so unsatisfactory and disappointing in this country.

A writer in *Gartenflora*, speaking of the profusion of roof and terrace gardens which enliven the streets of Paris, mentions as one of the most remarkable the terrace-garden of Monsieur Lockroy, the father of Victor Hugo's son-in-law. Once a popular writer of comedies and operettas, Monsieur Lockroy is now above all an amateur gardener, and his "hanging garden," which lies twenty metres above the street, shows the results of thirty years' affectionate labor. Its care is entirely in his own hands, and in a multitude of pots he grows not only beautiful Roses and other flowers in profusion, but fine pears and peaches, apples and luscious grapes, which clothe a wall that rises above the terrace, and which "have never been endangered by the phylloxera." In winter sufficient protection for the plants is afforded by a temporary light shed with sliding panels, which may be opened in propitious weather.

We have received several chestnuts of named varieties from different nurserymen. One of these from the Pomona Nurseries at Parry, New Jersey, is the nut of a Japanese variety, and it is well named Giant from its remarkable size. Mr. Samuel C. Moon sends a sample of the variety Numbo, and Mr. William H. Moon also sends some fine specimens. These nuts vary in quality, but none of them equal in sweetness the nuts on our native trees. The Japanese nut is surrounded by an especially bitter and puckery skin, which can, however, be easily removed. All these big nuts are greatly improved in flavor by being boiled or roasted, and when thus prepared they are almost as good in quality as the American chestnut. There is little doubt that a grove of any of these large varieties would prove a remunerative investment in places where the trees are hardy. It is high time for some of our experiment stations to begin the work of crossing the foreign kinds upon our native stock for the purpose of securing a race of hardy trees which will produce nuts at once of large size and the best quality. Practically nothing has ever been done in the way of developing our native nuts by selection, and no one knows how much improvement is possible until the same care in crossing and selecting is used to produce an ideal Chestnut as has been exercised for generations in perfecting the Apple or the Pear. The nurserymen, who are giving an impulse to nut-culture by calling attention to the possibilities in this direction, are doing the country good service.

The annual report of the superintendent of the Royal Botanic Garden at Trinidad has reached us, and, like its predecessors, contains a large amount of useful information about various tropical economic plants and several interesting and instructive illustrations, the most striking being that of a noble specimen of *Corypha elata*, surmounted by an enormous panicle of fruit estimated to weigh over a ton. Mr. Hart calls attention to the fact that the large crown of leaves borne by this Palm withered and fell flat to the stem soon after the appearance of the huge panicle of flowers. As the fruit set and commenced to develop the leaves became dry, then hung down (as shown in the illustration) and finally fell off, leaving nothing but the crowning panicle of fruit. Mr. Hart remarks: "From the early falling and drying away of the leaves after the period of anthesis, it is fully evident that they cannot assist in any way during the period in supplying or manufacturing the plant-food necessary for the formation and development of the seeds, and that the supplies and material for such purpose must have been accumulated and deposited in an easily assimilated form in the stem itself. This will form an important fact for those who are discussing the movement of fluids in the cells of plants." He points out that morphosis of this character, although rare in temperate climates, is a familiar feature in tropical vegetation. The Silk Cotton-tree, *Eriodendron anfractuosum*, of which a portrait appeared in Garden and Forest (iii., p. 341), is cited as an illustration of this phenomenon. This tree produces its flowers and sets its fruit at a period of the year when it is entirely destitute of leaves, the seeds being distributed by means of the cotton attached to them just as the tree is putting out the new set of leaves for the season. Mr. Hart, as he has in previous reports, deplores the want of interest taken in forest-preservation on the island, and the inevitable destruction, under the existing feeling on the subject, of the valuable forests which still occur in some parts of Trinidad.